# DR. MORTON'S DISCOVERY OF ANESTHESIA.

MORTON'S INHALER.

IN the January number of THE CENTURY appeared a very interesting article by Miss Eve Blantyre Simpson, telling how her distinguished father discovered the anesthetic properties of chloroform in 1847. A year before that, however, the conquest of pain had been achieved, and in all the leading hospitals, both here and abroad, surgery was already robbed of its terrors by means of the inhalation of sulphuric ether.

Sir James Y. Simpson was, as all the world knows, a most eminent surgeon, but his chief claim to undying fame rests on his discovery that chloroform possessed properties similar to those which it had already been demonstrated belonged to sulphuric ether. But while he has been honored, the American who made the earlier and far greater discovery still sleeps "unthought of in obscurity." No statue of him has anywhere been erected, no bust of him adorns any of the halls of medicine or the hospitals, where it is due to him, to use the eloquent words of Dr. Oliver Wendell Holmes, that "the fierce extremity of suffering has been steeped in the waters of forgetfulness, and the deepest furrow in the knotted brow of agony has been smoothed forever."

Dr. William T. G. Morton was born August 9, 1819, on a farm in the township of Charlton, Massachusetts. His father having lost money in some commercial speculation, at the age of sixteen the boy, who had already determined to study medicine, had to leave school to earn his own living.

In one situation or another young Morton continued to support himself until he was twenty-one. He then came into possession of a little money left him by an aunt, which, added to what he had saved, it seemed to him could be made the means, by judicious husbanding, of enabling him to realize the wish that was still dear to his heart. He resolved to study dentistry, and to support himself by its practice while qualifying himself to become a physician. In due time he obtained his diploma, and, after one or two attempts elsewhere, opened an office in Boston, where his success was rapid.

It was customary among dentists at that time, when fitting false teeth, to set them upon gold plates placed directly above the fangs of the old teeth. Dr. Morton obtained a new kind of solder for attaching artificial teeth to the plate, of the same character as the plate itself, thus preventing any galvanic action between them. But, to demonstrate satisfactorily its superiority, it was necessary to remove the roots of the decayed teeth. This, of course, was a painful process, and there were few persons with courage and stoicism sufficient to submit to the ordeal, It soon became evident to him that if his improved method were ever to become popular, he would have to find some way of preventing, or at least of greatly mitigating, the suffering caused by the extraction of the old roots. Thus, almost at the outset of his career, he was led to speculate and study and make experiments for the purpose of discovering some agency by which he could produce at least partial insensibility to pain.

He conducted these experiments with the energy and persistence that were characteristic of him. He tried all the opiates for alleviating pain that were then commonly used by physicians, even having recourse to mesmerism; but though he succeeded occasionally in rendering the pain less acute than it would have been had no medicines been employed, the net result of all his efforts was exceedingly discouraging.

Though the practice of dentistry had absorbed so much of his time and attention, and had opened up unsuspected fields for original research and experiment, Morton had by no means relinquished his purpose of becoming a physician. In March, 1844, he entered his name as a student of medicine in the office of Dr. Charles T. Jackson of Boston.

In July, 1844, a Miss Parrott of Gloucester, Massachusetts, called at his office to have a tooth filled. Because of its extreme sensitiveness, and her own keen susceptibility to pain, she could not at first endure the application of an instrument. To deaden the pain, Dr. Morton applied chloric ether to the affected part. Its use for such purpose was then no secret; other dentists had used the same preparation. Miss Parrott paid several visits to Dr. Morton's office, and he used the chloric ether freely, often keeping it sealed up in the hollow tooth. On introducing the instrument into the cavity of the tooth in search of the sensitive portion of the bone, he found that the patient experienced no

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W. T. G. Morton

pain whatever, and, much to his surprise, that the surrounding parts were benumbed.

"The idea instantly occurred to me," he said, in speaking of the matter "that if I could devise some means for bringing the whole system under the influence of ether, it would be a most valuable means of relief in more intense or more diffused pain." He lost no time in seeking to test, by actual experiment, the value of the idea that had flashed upon him. He repaired to his father-in-law's farm at Farmington, Connecticut, and applied chloric ether to insects, birds, and various small quadrupeds. But beyond contributing some additions to the long list of dumb martyrs to science, he accomplished nothing that had more than a negative value. Somewhat discouraged, but still firm in the faith that somewhere there must exist something by which pain could be prevented, he returned to Boston, and a few weeks later matriculated at the Medical School of Harvard University.

Attendance at the clinical lectures, and at operations in the Massachusetts General Hospital, formed part of the course then pursued by medical students. It was a privilege of which young Morton gladly availed himself. Then was revealed to him how terrible was the sway which pain exercised over sensitive organizations, and how utterly incapable of controlling and subduing it were medical science and surgical skill. Again and again the great idea which he had conceived, that there was some way of shackling this awful monster of torture, stirred within him, and urged him to leave nothing undone to discover by what beneficent agency it could be accomplished.

To chemists some of the peculiar properties

of nitrous oxid gas, or "laughing-gas," as it was then commonly called, because of the peculiar effects produced by its inhalation, had long been known. In 1799 Sir Humphry Davy published an account of his researches and experiments with it, describing the relief it afforded him when suffering from headache and toothache, and making this remarkable suggestion: "As nitrous oxid, in its extensive operation, appears capable of destroying physical pain, it may probably be used with great advantage during surgical operations in which no great effusion of blood takes place."

It happened that on December 11, 1844, Dr. Horace Wells, a former partner of Morton in the dental business, for a brief period attended a private exhibition of the effects produced by laughing-gas given by C. Q. Colton at Hartford. While under the influence of the gas, one man stumbled, and bruised his shins badly, but was unconscious of any pain until the effects of the gas had passed off. Slight as was the incident, it made a profound impression on Dr. Wells.

As he was troubled at this time with an aching tooth, he decided to make a practical test of his theory on himself. He inhaled the gas while another dentist extracted the tooth.

"A new era in tooth-pulling!" he exclaimed. "It did not hurt me as much as the prick of a pin. It is the greatest discovery ever made."

After a few more or less successful experiments, in order to obtain something like an official indorsement of his methods, he repaired to Boston to give an exhibition of painless tooth-pulling in the presence of a number of physicians and medical students. Dr. Morton consented to assist him. Dr. Wells administered the gas, and extracted the tooth, but the patient, instead of remaining in blissful unconsciousness during the operation, screamed with pain. Some of the spectators laughed, and others hissed. The exhibition of "painless tooth-pulling" was a painful failure. For his participation in the affair Dr. Morton came in for no small share of ridicule.

Much discouraged, Dr. Wells returned to Hartford, and told his friends that no dependence was to be placed on the gas; that it did not produce the same effects in all cases. He abandoned his experiments, and soon relinquished the practice of dentistry, and busied himself with other pursuits. He narrowly missed making a great discovery. With a little more persistence, he would certainly have ascertained that his humiliating failure was due to the fact that he did not administer enough gas to produce complete anesthesia in all cases. As it was, it was left for others to discover how to administer it so as to render it available for the performance of minor operations requiring only a short space of time. More than fifteen years elapsed before the "new era in tooth-pulling," by means of nitrous oxid gas, became a reality.

Though Dr. Wells's exhibition was a failure, it stimulated Dr. Morton to renewed exertions, apprizing him as it did that he was not alone in seeking some means of subduing pain, and it suggested to him a new line of experiments in the application of ether. It was almost as volatile as nitrous oxid gas; why might it not, when inhaled, accomplish what the gas had failed to do? Its efficacy in producing local insensibility when applied to a mucous membrane he had already ascertained by experiment. If taken into the lungs, it would at once be applied to a surface of mucous membrane greater than existed in all the rest of the body put together. Moreover, it would reach the place most favorable for the dispersion of its benumbing properties through the system.

These were the ideas that flashed through his mind. But there were grave considerations which made him pause before rashly putting them to the test. He did not know, nor at that time did anybody else know, how far the inhalation of ether might be pursued with safety. Yet its inhalation for medical purposes was not infrequent. In a pamphlet published in 1795 mention is made of the beneficial effects produced by this means in the treatment of diseases. Dr. John C. Warren of Boston employed it in 1805 for relieving the last stages of pulmonary inflammation. But though, apparently, many physicians and chemists had been on the verge of discovering that the inhalation of sulphuric ether would produce insensibility to pain, they all failed to push their researches far enough. They seem to have concluded that its inhalation to the extent of producing unconsciousness would be attended by very serious, if not fatal, consequences, and they admonished practitioners to exercise extreme caution in administering it.

With characteristic intrepidity, Dr. Morton's first experiments were made upon himself. It occurred to him that ether, if combined with such narcotics as he had been in the habit of using in his practice, would probably produce insensibility to pain more speedily and assuredly than if used alone. He placed a mixture of ether and morphine in a retort, around which he wrapped a hot towel, and, with many misgivings, he inhaled the mixture. In a similar way he also inhaled a preparation of ether and opium. He was punished for his temerity by some splitting headaches, but when, emboldened by the discovery that no severer pains or penalties were imposed upon him, he gradually prolonged the periods of inhalation, he was rewarded by the perception of a distinct feeling of numbness pervading his body and limbs.

In the spring of 1846 he again posted off to the

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MRS. ELIZABETH W. MORTON, 1845, AGED 18.

country, this time to his own place at Wellesley, to experiment on some denizens of the farmyard. He etherized a hen, and cut off its comb, the hen meanwhile making no protest, or indicating in any way that it had any personal interest in the proceedings. Still more satisfactory was an experiment tried on a favorite water-spaniel.

When Dr. Morton returned to Boston, he was so confident that he would succeed, that he determined to turn over the management of his office and practice to other hands, that he might devote himself exclusively to the prosecution of his researches and experiments. The sacrifice that this involved affords a measure of his faith. He had built up an enormous practice, his receipts having risen to $20,000 a year, while his expenditures were $10,000, and still he had found time to keep up his study of medicine, and to attend lectures.

There remained the crucial test, to ascertain, by administering ether to some human being, whether it would really produce insensibility to pain, as it had apparently done in the case of the spaniel. He promised two of his assistants, William P. Leavitt and Thomas B. Spear, five dollars apiece if they could find a man who would take the ether, and submit to having a tooth drawn while under its influence. They made search, but failed to find one.

He succeeded at last in inducing the two assistants themselves to inhale the ether from a handkerchief. But with each of them in turn the sensation of drowsiness at first induced rapidly passed away, and they grew violently excited. Much puzzled was Dr. Morton to account for results so unexpected, until he had a sample of the ether analyzed, and discovered that, unlike that with which he had previously experimented, the ether, which he had obtained at a wholesale drug-house, contained twenty-five per cent. of free alcohol.

After obtaining some chemically pure sul-

phuric ether, on September 30, 1846, Dr. Morton returned to his office determined to test its efficacy on himself. He shut himself up alone in a room to make the experiment. It was an act revealing courage of a high order, and a sublime faith. The annals of science and medicine contained no record of the effects of ether when inhaled to the extent of producing complete unconsciousness. Hints there were not a few that to inhale it was to invite grave injuries and possibly death itself.

It was an heroic act, but with modest simplicity Dr. Morton describes it in his memoir to the Academy of Arts and Sciences at Paris.

Taking my tube and flask [he wrote], I shut myself up in my room, seated myself in the operating-chair, and commenced inhaling. I found the ether so strong that it partially suffocated me, but produced no decided effect. I then saturated my handkerchief, and inhaled it from that. I looked at my watch, and soon lost consciousness. As I recovered, I felt a numbness in my limbs, and a sensation like nightmare, and would have given the world for somebody to come and arouse me. I thought for a moment I should die in that state, and that the world would only pity or ridicule my folly. At length I felt a slight tingling of the blood in the end of my third finger, and made an effort to press it with my thumb, but without success. At a second effort I touched it, but there seemed to be no sensation. I gradually raised my arm, and pinched my thigh, but I could see that the sensation was imperfect. I attempted to rise from my chair, but fell back. I immediately looked at my watch, and found that I had been insensible between seven and eight minutes.

For him rest was now impossible until that one step more was taken which would prove that what the world had so long waited for had been discovered — something that could subdue pain. In his own words, recorded by the late Mrs. Harriette Woods Baker:

I had become much excited, and had determined that I would not leave the office until I had seen something more of the power of this new agent [he wrote]. Twilight came on, but in my present state I felt it to be impossible to go home to my family. As the evening wore away my anxiety increased. The hour had long passed when it was usual for patients to call. I had just resolved to inhale the ether again, and have a tooth extracted under its influence, when a feeble ring was heard at the door. Making a motion to one of my assistants, who started to answer the bell, I hastened myself to the door, where I found a man with his face bound up, who seemed to be suffering extremely.

"Doctor," said he, "I have a dreadful tooth, but it is so sore I cannot summon courage to have it pulled. Can't you mesmerize me?"

I need not say that my heart bounded at this question, and that I found it difficult to control my feelings, but putting a great constraint on myself, I expressed my sympathy for the man and invited him to walk into the office. There were no instruments in sight to terrify him, and the ether was close at hand, every arrangement having been previously made in the hope that a similar case might occur. I examined the tooth, and in the most encouraging manner told the poor sufferer that I had something better than mesmerism by means of which I could take out his tooth without giving him pain. He gladly consented, and, saturating my handkerchief with ether, I gave it to him to inhale. He became unconscious almost immediately. It was dark. Dr. Hayden held the lamp. My assistants were trembling with excitement, apprehending the usual prolonged scream from the patient, while I extracted a firmly rooted bicuspid tooth. I was so much agitated that I came near throwing the instrument out of the window. But now came a terrible reaction. The wrenching of the tooth had failed to rouse him in the slightest degree. Instead of the quick start of relief with which a patient usually leaves the operating-chair the moment the instruments are withdrawn, he remained still and motionless as if already in the embrace of death.

The terrible thought flashed through my mind that he might be dead, that in my zeal to test my new theory I might have gone too far and sacrificed a human life. With the rapidity of lightning my mind ran through the whole process of my investigations up to the present hour. I trembled under the sense of my responsibility to my Maker and to my fellow-men. The question, Can I restore him to consciousness? startled me into action. I seized a glass of water, and dashed it in the man's face. The result proved most happy. He recovered in a minute, and knew nothing of what had occurred. Seeing us all stand around him he appeared bewildered. I instantly, in as calm a tone as I could command, asked:

"Are you ready to have your tooth extracted?"

"Yes," he answered in a hesitating tone.

"It is all over," I said, pointing to a decayed tooth on the floor.

"No!" he shouted, leaping from the chair.

For the next two weeks Dr. Morton hardly allowed himself time to sleep. He devoted much attention to endeavoring to ascertain the best methods of administering the ether. By the varying results obtained in the experiments which followed one another in rapid succession at his office, it was made apparent to him that in this respect much remained to be learned.

Then arose the question, How was he to make his wonderful discovery known to the world? Had he gone abroad and proclaimed from the house-tops that he had found out how to conquer pain, he would have been laughed at as a demented enthusiast, or denounced as an impudent and dangerous quack, of whom the good city of Boston should rid herself as speedily as possible. After consultation with friends he decided that to gain recognition for his dis-

covery, he must give a demonstration of its efficacy under conditions that would preclude any suspicion of deception, and in the presence of witnesses who would command the confidence of the medical profession of the world.

No more fitting place was there in all Boston for such a work than the Massachusetts General Hospital. Dr. Morton obtained permission from Dr. John C. Warren, the senior surgeon, to make a trial of his pain-annihilator at the hospital. On Wednesday, October 14, 1846, he received a note from Dr. Warren, requesting him to be present at the hospital at ten o'clock the next Friday morning, to administer his preparation to a patient who was then to be operated on. On that morning he arose at four o'clock, hurried off to the house of an instrument-maker, and, awaking him, induced him to undertake forthwith the construction of an inhaler, the design for which had been prepared only on the previous evening. As the hour appointed for the test drew near, and it was still uncompleted, Dr. Morton snatched it from the maker's hands, and hurried off to the hospital.

Meanwhile, within, all necessary preparations for the operation had been made. The patient selected for the trial was Gilbert Abbott, who was suffering from a congenital but superficial vascular tumor just below the jaw on the left side of the neck. The announcement that the operation was to furnish a test of some preparation for which the astounding claim had been made that it would render the person treated with it temporarily incapable of feeling pain had attracted a large number of medical men to the theater. It was inevitable that nearly all of those present should be skeptical as to the result. As the minutes slipped by without any sign of Dr. Morton, the incredulous gave vent to their suspicions concerning him and his discovery.

"As Dr. Morton has not yet arrived," said Dr. Warren, after waiting fifteen minutes, "I presume that he is otherwise engaged."

The response was a derisive laugh, clearly implying the belief that Dr. Morton was staying away simply because he was afraid to submit his discovery to a critical test.

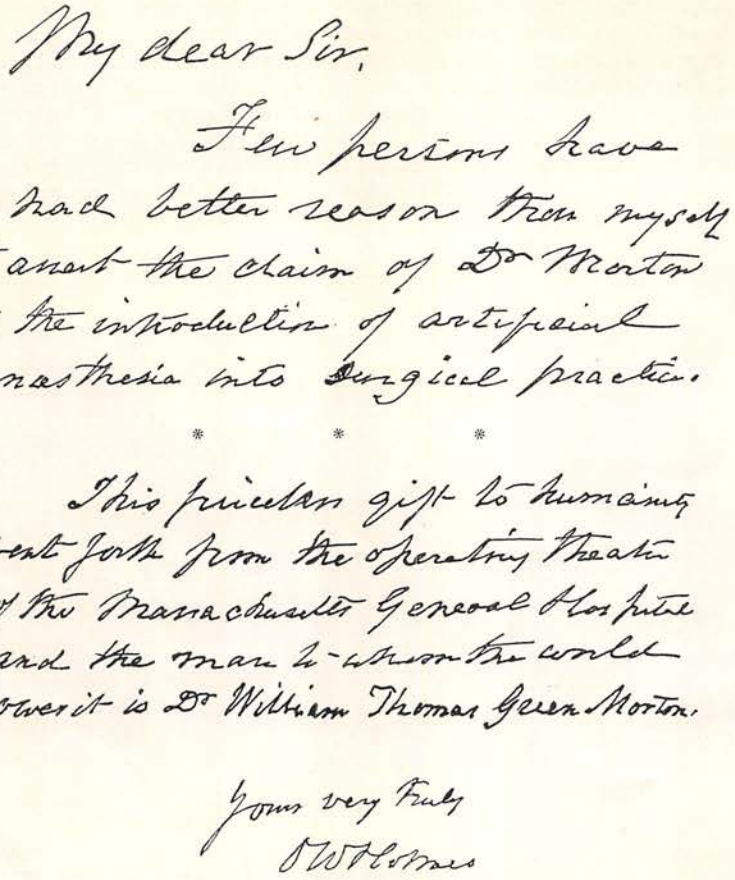
Dr. Warren grasped the knife. At that critical moment Dr. Morton entered. No outburst of applause, no smiles of encouragement, greeted him. Doubt and suspicion were depicted on the faces of those who looked down upon him from the tiers of seats that encircled the room. No actor about to assume a new rôle ever received a more chilling reception.

"Well, sir," exclaimed Dr. Warren, abruptly, "your patient is ready."

Thus aroused from the bewilderment into which the novelty of his position had thrown him, he spoke a few words of encouragement to the young man about to be operated on, adjusted the inhaler, and began to administer the ether. As the subtle vapor gradually took possession of the citadel of consciousness, the patient dropped off into a deep slumber.

DRAWN BY ALEXANDER SCHILLING. FROM A PHOTOGRAPH.

ETHERTON COTTAGE AT WELLESLEY, MASS., HOME OF DR. MORTON, WHERE THE EARLY EXPERIMENTS AND DISCOVERY OF ANESTHESIA WERE MADE.


My dear Sir,

Few persons have or had better reason than myself to assert the claim of Dr Morton to the introduction of artificial anæsthesia into Surgical practice.

* * *

This priceless gift to humanity went forth from the Operating Theatre of the Massachusetts General Hospital and the man to whom the world owes it is Dr William Thomas Green Morton.

Yours very Truly
O W Holmes

FACSIMILE OF PARTS OF A LETTER WRITTEN BY DR. OLIVER WENDELL HOLMES.[1]

Dr. Warren seized the bunch of veins, and made the first incision with his knife.

Instead of awakening with a cry of pain, the patient continued to slumber peacefully, apparently as profoundly unconscious as before.

Then the spectators underwent a transfor-

[1] This letter was written in reply to an inquiry addressed by the writer of the present article to Dr. Oliver Wendell Holmes, who was a member of the medical staff of the Massachusetts General Hospital at the time of the discovery. Following is the full text:

"BOSTON, April 2, 1893.

"MY DEAR SIR: Few persons have or had better reason than myself to assert the claim of Dr. Morton to the introduction of artificial anesthesia into surgical practice. The discovery was formally introduced to the scientific world in a paper read before the American Academy of Arts and Sciences by Dr. Henry J. Bigelow, one of the first, if not the first, of American surgeons.

On the evening before the reading of the paper containing the announcement of the discovery, Dr. Bigelow called at my office to read the paper to me. He prefaced it with a few words which could never be forgotten.

He told me that a great discovery had been made, and its genuineness demonstrated at the Massachusetts General Hospital, of which he was one of the surgeons. This was the production of insensibility to pain during surgical operations by the inhalation of a certain vapor (the same afterward shown to be that of sulphuric ether).

In a very short time, he said, this discovery would be all over Europe. He had taken a great interest in the alleged discovery, had been present at the first capital operation performed under its influence, and was from the first the adviser and supporter of Dr. W. T. G. Morton, who had induced the surgeons of the hospital to make trial of the means by which he proposed to work this new miracle.

The discovery went all over the world like a conflagration. The only question was whether Morton got advice from Dr. Charles T. Jackson, the chemist, which entitled that gentleman to a share, greater or less, in the merit of the discovery. Later it was questioned whether he did not owe his first hint to Dr. Horace Wells of Hartford, which need not be disputed.

Both these gentlemen deserve honorable mention in connection with the discovery, but I have never a moment hesitated in awarding the essential credit of the great achievement to Dr. Morton.

This priceless gift to humanity went forth from the operating theater of the Massachusetts General Hospital, and the man to whom the world owes it is Dr. William Thomas Green Morton. Yours very truly,

"O. W. HOLMES."

mation. All signs of incredulity and indifference vanished. Not a whisper was uttered. As the operation progressed, men began to realize that they were witnessing something the like of which had never been seen before.

When the operation was over, and while the patient still lay like a log on the table, Dr. Warren, addressing the spectators, said, with solemn emphasis, "Gentlemen, this is no humbug."

But notwithstanding that Dr. Morton had thus demonstrated that a patient could be rendered completely insensible to suffering while undergoing an operation, yet for three weeks the employment of the ether at the hospital was discontinued, and surgery and agony still went hand in hand. In fact, instead of being hailed as a public benefactor, Dr. Morton found himself, for a short period immediately following the public announcement of his discovery, the target for indignant scorn and contempt. He was pilloried in the public prints by medical men and laymen as a charlatan.

Dr. Morton made application at the hospital on November 6, for permission to test the efficacy of his discovery on a patient who the next day was to undergo an amputation of the leg. Then he was told that the surgeons at the hospital deemed it their duty to decline to use the preparation until informed what it was. Dr. Morton professed his entire willingness to inform the surgeons, confidentially, what the preparation was. But for some reason this did not satisfy the exacting code of medical ethics. Through the pleas of Dr. Henry J. Bigelow, Dr. Morton was finally allowed to administer ether when Alice Mohan, a delicate girl of twenty, who had been in the hospital more than a year suffering from a disease of the knee joint, underwent an amputation of the leg, as the only alternative offered for preserving her life. Instead of filling the chamber with her agonizing shrieks, she slept the sleep of oblivion through it all; and when she revived, refused to believe that the leg had actually been removed.

After that Dr. Morton frequently administered the ether at the hospital, and always with complete success. In 1848 the trustees showed their appreciation of his services, and his free gift of the discovery to the hospital, by presenting him with a silver box containing one thousand dollars, the inscription concluding with these words, "He has become poor in a cause which made the world his debtor."

Dr. Morton shared none of the joys which his discovery brought to thousands of his fellow-creatures, but reaped only a harvest of misery and misfortune, blighted hopes, ruined health, and bankruptcy. He was granted a patent for his discovery. When the use of it was freely offered the army and navy, both departments declined to have anything to do with it, but nevertheless at their convenience employed it in their hospital service. For nearly two-score years he sought redress in vain. But there is no space here to tell that sad story, nor to enter into discussion of the claims of Dr. Jackson and Dr. Wells, both of whom maintained that they were entitled to the honor and credit of making the discovery.

The ether controversy was a bitter one; but the obscuring smoke of the battle has long since rolled away, and one fact stands out as clear as the noonday sun — namely, that it is to Dr. Morton that the world is indebted for its knowledge of the complete anesthetic properties of sulphuric ether. It was he who did the work; he who made the experiments; he who dared to assume the risk of public failure and disaster and possible loss of life.[1]

Dr. Morton died suddenly of apoplexy on July 15, 1868. His widow is still living. Her maiden name was Elizabeth Whitman, and she was a daughter of Edward Whitman of Farmington, Connecticut. Her most vivid recollections of her husband's great discovery are associated with that memorable October 16, 1846, when for the first time he administered ether at the Massachusetts General Hospital.

"In those few hours," she said to the writer, "I learned to realize what is meant by the agony of suspense. I had heard it often predicted that he would kill somebody by his experiments. My mind recoiled from such a thought with horror, and yet was forced to dwell upon it. I knew not what minute a messenger might arrive with the information that my husband had been arrested for manslaughter. When he returned, there was that in his face which told me, before he opened his lips, that he had triumphed."

*E. L. Snell.*

[1] Dr. Morton received a valuable indorsement of his rights as a discoverer from Dr. Simpson. The professor had just published a pamphlet upon chloroform, the application of which he had discovered, and which he proposed as a substitute for ether in certain cases. Upon a fly-leaf of a copy of this pamphlet which he sent to Dr. Morton was written the following note:

MY DEAR SIR: I have much pleasure in offering, for your kind acceptance, the accompanying pamphlet. Since it was published we have had various other operations performed here, equally successful. I have a note from Dr. Liston, telling me also of its perfect success in London. Its rapidity and depth are amazing.

*In the Monthly Journal of Medical Science for September, I have a long article on etherization, vindicating your claims over those of Jackson.*

*Of course the great thought is that of producing insensibility — and for that the world is, I think, indebted to you.*

I read a paper lately to our society, showing that it was recommended by Pliny, etc., in old times.

With very great esteem for you, allow me to subscribe myself, Yours, very faithfully,

J. Y. SIMPSON.

EDINBURGH, Nov. 19, 1847.